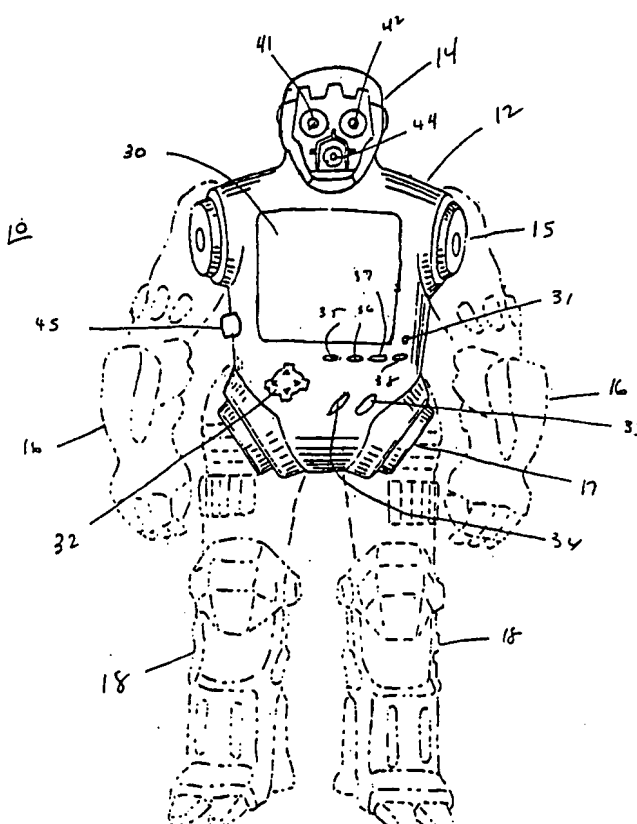


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<p>(54) Title: ACTION FIGURE TOY WITH COMMUNICATION DEVICE</p> <p>(57) Abstract</p> <p>The action toy figure construction (10) which enables a user to play a preprogrammed game with other such action figure toy constructions is described. The action figure toy construction includes a torso portion (12) and a memory for storing a preprogrammed game. A controller responds to input signals from user input commands to buttons on the exterior of the figure and operates the preprogrammed game, outputting data, graphics and text images to a torso mounted display. Lights, sound generator, microphones, metal detectors and motion sensors may also be coupled to the controller.</p> 		

ACTION FIGURE TOY WITH COMMUNICATION DEVICE

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Background of the Invention

This invention relates to a doll-like toy construction with a built-in electronic game apparatus and a method of communicating between doll-like toy constructions. More particularly, this invention relates to an action figure toy with a built-in electronic game apparatus and a method of communicating and playing the built-in electronic game with other action figure toys, with a computer and over a communications network, such as the Internet.

"Action figure" toys have become increasingly popular with children in recent years. Toys of this nature are generally doll-like in configuration, and are frequently configured to resemble television or motion picture characters, either real or fictional, as portrayed in both animated and filmed versions. Since children frequently play with toys of this nature by engaging in mock combat and battles, expeditions and other adventures, these types of toy constructions are generally referred to as action toys.

While toy constructions of this nature may be configured to resemble human beings, such figures may also be configured to appear as robots, as aliens or as

- 2 -

beings having combinations of humanoid and robotic characteristics. Other types of action figures may be configured as animals or animal characters, or as vehicles, such as cars, aircraft and space ships. Such action figure toys may have accessory vehicles, houses, mock weapons and the like for enhanced entertainment. Action figures, in general, have proven to be among the most popular of children's toys.

U.S. Patent No. 4,802,879 to Rissman et al., "Action Figure Toy with Graphics Display" describes an action figure toy in which a graphics display is located in the humanoid torso portion. Microprocessor controls are provided for operating and controlling the graphics display to show a representation of a plurality of simulated life functions, thus lending animation to the toy construction. Such simulated life functions includes a beating heart and circulating blood passages. The toy also includes light sensors so that when the toy is hit, for example, by a light beam, simulating a laser attack, the graphics display is varied to show the extent of the toy figure's simulated injury.

U.S. Patent No. 4,813,907 to Rissman et al., "Toy Vehicle with Graphics Display" describes a toy vehicle construction which has been configured to exhibit animated characteristics. A liquid crystal graphics display is provided on the chassis of the vehicle and is particularly configured to display simulated life functions. An associated microprocessor effects operation and control of the graphics display, with additional sound generating, light emitting and detecting devices further provided to lend to the animated nature of the device.

Inexpensive, hand-held electronic games have become more popular as the complexity and increasing costs of

- 3 -

the cartridge-style video games, games in which the user can play more than one game by replacing a game cartridge in the game unit, have increased. Additionally, while users enjoy the low cost of single game electronic game, 5 users have grown to expect features of the higher priced and more complex games to be included in the less expensive units. Action figures, by contrast, are generally more limited in the types of game play available.

10 Some of the features sought after by users include access to upgrades to lengthen the life of the electronic game, hidden features and functionality, and the ability to engage in multi-user game play. Also, the advent and increased popularity of the Internet in homes has made 15 multi-user game play with remote users and access to manufacturer web pages as close as the family personal computer.

Increased miniaturization and reductions in manufacturing costs in the semiconductor industry have 20 made more sophisticated games for the hand-held electronic game apparatus industry possible. An example of an improved hand-held electronic game is described in co-pending application, assigned to the assignee of this invention, serial number 08/940,732 filed September 30, 25 1997, "Electronic Game." However, even with such improvements, the memory available for such hand-held games, often no larger than a key fob or pocket watch, is insufficient to include the additional software needed to provide the increased functionalities sought. Such 30 simple games, for example, do not contain the additional software or hardware needed to link with other games.

Examples of previous efforts to link game apparatuses are known in the prior art. US Patent No. 5,048,831 to Sides discloses a hand-held electronic game

- 4 -

apparatus useable by a single player, but also useable for direct competitive play between two or more players through both direct physical linkage of multiple units of the apparatus and indirect linkage by radio signals or the like. The electronic apparatus of Sides is designed for larger, more complex games and requires a communications link be built into each electronic game apparatus. Further, the electronic game apparatus of Sides contemplates operating on larger power supplies such as 12 volt batteries or common household AC current, which is far greater than the typical 3 volt battery power supplies used in inexpensive, hand-held electronic game apparatuses.

Vaughn et al. US Patent No. 5,643,088 discloses a game of skill or chance playable by remote participants in conjunction with a common game event including inserted interactive advertising. This system requires communication with a remote central computer and does not permit game play between two or more users directly.

There is a need for an improved action figure type toy with increased game play, similar to that available to hand-held games. There is also a need for an action figure type toy which can engage in interactive play with other action figure type toys. There is a further need for an action figure type toy which can communicate and engage in electronic game play with other action figure type toys and other electronic systems, such as over the Internet.

Summary of the Invention

To achieve the foregoing and other objects, an action figure toy construction having interactive, preprogrammed game play characteristics is described. The action figure toy construction is a physical

- 5 -

representation of a character in a preprogrammed game stored within the toy construction. The preprogrammed game includes means for generating, uniquely identifying and controlling a plurality of separate game functions involving a virtual character. The action figure toy construction includes a torso portion configured to resemble a three-dimensional representation of the virtual character and has a hollow interior for holding electronic components. For action figures configured to resemble a humanoid or animal, the toy will also include a head, arms (if applicable) and legs. As with other action type figures, the head, arms and legs may be moveable. Some of the electronic components may be located within the head, arms or legs, as applicable. In a preferred embodiment, the majority of the electronic components will be located within the torso section. Action figure toy constructions configured in the shape of a vehicle, such as a car, airplane or space craft would also preferably have the majority of the electronic components located within the main body of the vehicle. As applicable, other portions may be located in wings, for example.

The action figure toy construction includes a memory for storing a preprogrammed game and other temporary data that may be generated during play of the game. The preprogrammed game includes means for generating, uniquely identifying and controlling a plurality of separate game functions. A preferred action figure toy construction is a fighter. The preprogrammed game for the fighter includes a routine for training the fighter in several fighting skills as well as a routine for enabling the fighter to engage in mock battles with another action figure toy construction or with a fighter

- 6 -

on an Internet website or with a computer version of the fighter preprogrammed game.

An input device for enabling the user to input commands to control and play the preprogrammed game is located at a convenient location on the action figure toy construction. Preferably, a plurality of buttons and a directional wheel or button are provided. The buttons generate input signals in response to input commands from the user. These signals are fed to a controller which runs or operates the preprogrammed game. The controller responds to the input signals and program functions in the preprogrammed game for receiving, processing and outputting data, graphics and text images, and control signals during operation of the preprogrammed game. A display, preferably mounted on the torso, displays graphics and text images.

Preferably, the action toy figure construction includes one or more lights, such as light emitting diodes (LEDs), which are controlled by the controller. For example, two LEDs mounted in the head for the eyes can be lit when the preprogrammed game begins or when power is turned on. Other lights may be associated with mock weapons built into the torso. For example, one arm may have a laser gun attached to the hand. When the preprogrammed game calls for the laser gun to be fired, or when the user selects the appropriate button commands, the LED on the laser gun attached to the toy's hand is turned on.

Also preferably, the action toy figure construction includes a sound generator for playing sounds in accordance with play of the preprogrammed game. For example, the action toy figure construction can play programmed phrases consistent with portions of the game play. If the action toy figure construction is a fighter

- 7 -

engaging in a mock battle, when hurt, the sound generator could play an appropriate sound. Sounds may also be played or generated when a laser gun or other mock weapon is firing to create greater enjoyment for the user.

5 As part of the play of some preprogrammed games, the action toy figure construction is "taught" or "trained" in certain activities. For example, the fighter must learn to perform certain preprogrammed fighting tricks. In addition to requiring an appropriate input response
10 from the user, such as selecting a particular button, preferably the action toy figure construction includes a sound detector for detecting verbal commands from the user. For example, when the user says, "Stop," the sound detector detects the sound and applies an input to the
15 controller. If the verbal command is appropriate in accordance with the preprogrammed game, the controller causes the action toy figure construction to cease whatever activity it was performing at the time.

Each action figure toy construction includes a
20 communications unit for enabling the toy to communicate with another electronic system. The communications unit preferably includes an RS-232 port coupled to the controller and located at a convenient location on the action figure toy construction. Two action figure toy
25 constructions may be linked together through their communications units enabling joint play of the preprogrammed game. Due to the size of the action figure toy constructions, it is not convenient to link them directly together, so a preferred method is with a cable
30 linking one communications port to the other.

For multiple toy game playing, a docking station may be used. The docking station includes a plurality of communications ports to which each action figure toy construction is attached via its communications port and

- 8 -

cable. The docking station includes a controller which enables all docked action figure toy constructions to play the preprogrammed game together. Each user can view the displayed action on his own toy's display.

5 Alternatively, the action figure toy construction may be linked via a cable to a personal computer and then from the personal computer over a modem connection to a Website on the Internet. From the Website, a central processing unit can download upgrades to the
10 preprogrammed game, unlock hidden features in the preprogrammed game or connect the user to other users similarly connected to the Website. The central processing unit can also simulate the preprogrammed game to enable the user to play the central processing unit.

15 Access to the Website will enable users to receive upgrades to the preprogrammed game, compete against the "computer" and other users, have their scores posted, have the computer unlock hidden features in the preprogrammed game. For preprogrammed games in which the
20 user trains a fighter, the user can also access the Website to vary characteristics of the fighter. For example, the computer at the Website can restore a fighter's health, change the fighter's age and weight and even perform some training (or behavior modification).
25 By being able to link their electronic game apparatuses to other electronic systems, including a Website and other electronic game apparatuses, users will receive increased benefit and enjoyment from their electronic game apparatuses.

30 Alternatively, a wireless communications port, such as an IR emitter and detector may be used. Many personal computers include an IR port for transferring data. The hard-wired or cable connection may be replaced with an IR

- 9 -

emitter and detector for communicating with other action figure toy constructions and a personal computer.

For added enjoyment, other sensors may be added to the action figure toy construction. For example, a metal
5 detector and a motion sensor. The metal detector may be used, for example, in action figure toy constructions configured as a vehicle to move along a metal track. The metal detector may be used to guide the vehicle along the track without having to equip the vehicle with track
10 fitting wheels. A motion sensor may be used to alert the user if someone is nearby, simulating an action figure toy construction on "guard duty" or "watch duty."

By enabling an action figure toy construction to play a preprogrammed game, the user achieves added
15 enjoyment. The user can move the arms, legs and head of the action figure in conjunction with the preprogrammed game play and respond interactively with the toy. Instead of a two dimensional representation on a display, the user gains greater enjoyment by playing with a three-
20 dimensional representation of the same character as it proceeds through the rigors of the preprogrammed game.

The action figure toy construction affords the user more enjoyment than playing a simple electronic game because the action figure toy construction is a physical
25 representation of a character in the preprogrammed game. Multi-action figure toy construction games are also more enjoyable because the user and their toys can act out physically some of the game play when linked together for multi-player game action. In addition to the games
30 thought up by the user's own imagination, the preprogrammed game affords the user the opportunity to think of additional ways to play with the action figure toy construction.

- 10 -

Brief Description of the Drawings

Figure 1 is a front elevation view of an action figure toy construction having an electronic game apparatus embodying the principles of the invention;

5 Figure 2 is a front elevation view of an alternate action figure toy construction having an electronic apparatus embodying the principles of the invention;

10 Figure 3 is a block diagram of two action figure toy constructions linked to each other according to the invention;

Figure 4 is a block diagram of an action figure toy construction linked via a cable to a personal computer and then to a Website on the Internet;

15 Figure 5 is a schematic of the electronics for the action figure toy construction of Figures 1 and 2;

20 Figure 6 is a schematic of a cable for linking an action figure toy construction according to the invention to another action figure toy construction, to a personal computer, or to a docking station for multiple toy game play; and

Figure 7 is block diagram of a docking station with two action figure toy constructions connected for multiple game play.

Detailed Description of the Preferred Embodiments

25 Referring first to Figure 1, therein is disclosed an action figure toy construction 10 embodying the principles of the invention. The illustrated embodiment is shown to have a generally human-like form and will be referred to as having humanoid characteristics. For
30 purposes of the present disclosure, it is to be understood that reference to human-like and humanoid characteristics is intended to encompass both human and non-human (i.e. robotic). Many such shapes are possible.

- 11 -

A preferred embodiment may be configured to resemble a warrior or soldier ("fighter"). Thus the construction may be arranged to include "armor" and may be provided with mock weapons (which may or may not be rigidly
5 attached to the toy) for the purposes of engaging in simulated "combat" and "battles" with another toy and in accordance with the play of a preprogrammed game contained within the toy.

Action figure toy 10 includes a molded humanoid torso 12, where the head portion 14 is generally shown as humanoid in form. Arms 16 and legs 18 are shown in shadow form, indicating that various arms and legs may be
10 interchangeably connected with a single torso 12 and also indicating that the bulk of the electronic components needed to operate the action toy are preferably located within the torso. To this end, torso 12 includes a pair of socket-like portions 15 for connecting arms 16 and a second pair of socket-like portions 17 for connecting legs 18. Not
15 shown are attachment weapons which may fit on one or the other arms. Alternatively, for some toys the weapon and arm may be molded or built as one complete piece. Thus, for some action figure characters, for example a robot, may have interchangeable weapon/arms or weapon/motive means/legs (i.e., wheels replacing legs).

25 A controller and memory (not shown) are located within torso 12. The controller operates a preprogrammed game, stored in memory and displays text and graphics images on a display 30 which may be an LCD display. In particular, game play (an example of a fighter is
30 described below) involves the action figure toy construction as the main character and its actions are displayed on display 30.

Several input controls for user input and interaction with the preprogrammed game are provided.

- 12 -

Button 31 is a reset button, for resetting action of the game play. Button 32 is a directional control for moving the character as displayed on display 30 up, down, right and left. Button 35 is the on/start switch for turning the unit on or beginning a game. Button 36 is a pause button for pausing action during game play. Button 37 turns sound on and off. Button 38 is the off button. Optional buttons 33 and 34 may be programmed to provide additional functions.

Connector 45 is shown located on the side of action figure 10 and is used, in conjunction with a separate cable, to attach the unit to another electronic system for play of the preprogrammed game. Connector 45 may be an RS-232 connector or other communications port.

Alternatively, connector 45 may be an infrared emitter and detector or other wireless means of communication. For an IR emitter/detector, connector 45 should be located to maintain a line of sight with the electronic system's IR emitter/detector.

Action figure toy construction 10 is shown with LEDs mounted in the head portion 14. LEDs 41 and 42 are mounted in the eye location. A speaker 44 is mounted in the mouth location. LEDs 41 and 42 and speaker 44 are activated by the controller in accordance with the preprogrammed game.

Figure 2 shows an alternate embodiment of the invention in which the action figure toy construction is configured in the shape of a vehicle. Referring to Figure 2, action figure toy construction 50 is configured in the shape of a vehicle, in particular an automobile with chassis 52 and wheels 70. Action figure toy construction 50 includes display 54 and input control buttons 56, 58, 59-62 and optional buttons 63 and 64. Optionally, a motor (not shown) may be provided for

- 13 -

moving wheels 70 in accordance with play of the preprogrammed game.

Figure 3 shows an example of how two action figure toy constructions 10 are connected together for multi-
5 player game play. Each action figure is connected from its connector 45 through cable 100 to the other figure's connector 45.

Figure 4 shows an example of an action figure toy construction 10 connected via its connector 45 to cable
10 100 to the input communications port 118 (which may preferably be an RS-232 port) of a personal computer 112. Personal computer 112 includes a display 114 for displaying game play as well as information from communicating with an Internet website. The user may
15 dial into an Internet website, by connecting through the personal computer's modem 116, through a telephone line 122 and into the Internet website of a multi-game play provider.

By connecting to a game Website on the Internet
20 through a modem or other communication means, the user can access many activities designed to increase enjoyment of the game. For example, the Website can download upgrades or modify the preprogrammed game. The Website can interact directly with the preprogrammed game, such
25 as by unlocking hidden features in the preprogrammed game or by modifying attributes of the game character.

The Website can check the user's character's name and verify the highest score achieved among all such characters. The Website and turn on or off certain
30 hidden features (such as enabling the user to save his games or change the speed of time in the game). The Website can cure any character to perfect health, grow or change any character's health, provide enhanced training. The Website can send messages or greeting screens to the

- 14 -

character. The Website can simulate another character (new or old) to interact (or fight) with the user's character. The Website can connect two or more users and enable their characters to interact (or fight). The Website can make the user's character perform new tricks for added fun and enjoyment.

While the user is playing a game with another user either directly using a cable connection or over the Internet, each user must input commands through the buttons on the action figure toy construction and view action on the toy's display. If connected to a personal computer, the personal computer's display may also display the game action. In addition, because the action figure toy construction is a three-dimensional representation of the character on the display, the user can move the action figure's arms and legs and play along physically with the game action, from time to time.

Figure 7 shows yet another way multiple users can enjoy multi-player game action. A separate docking station 200 includes four communications ports 204, 206, 208, 210 for connecting two to four action figure toy constructions 10 via cables 100. In this embodiment, two action figure toy constructions 10 to the player #1 slot 204 and player #2 slot 206. Docking station 200 includes a controller or microprocessor and memory (not shown) for enabling multi-player operation of the preprogrammed game. Buttons 212, 214 and 216 are provided to operate the docking station during multi-player game play. Preferably the unit is power by AC through a typical plug 202. The action figure toy constructions 10 are preferably battery powered (not shown). Play of the game by users is similar to that of the other multi-game play, with the docking station providing the same function as the personal computer and Internet connection. In this

- 15 -

way, users without access to the Internet can enjoy game play with more than just two action figure toy constructions connected directly together. Clearly, additional ports may be provided on the docking station
5 for play by more than four users.

Referring to Figure 5, a schematic of the circuitry of an action figure toy construction is shown. As noted above, the programming and location and number of buttons may vary depending on the preprogrammed game and the
10 intended functions of the particular action figure. In this example, the switches or buttons do not necessarily agree with those of action figure toy construction 10 described above.

The user turns on the apparatus by depressing on-off
15 switch 510, which is connected to microprocessor 506, preferably a SPL128 at pin 39. In this embodiment, the controller is shown as a microprocessor, but may also be another digital control device, such as an ASIC, gate array or programmable logic device. Microprocessor 506
20 (LCDEN at pin 40) supplies power to display 501, an 80 X 80 LCD, through voltage divider 504 via LCD Driver 502 (pin 48). LCD Driver 502 provides vertical signals and LCD Driver 503 provides horizontal signals to display 501. Audio signals are output through speaker 515, which
25 is controlled through microprocessor 506 at pins 78 and 79. Audio input signals from the user to modify game play are received through microphone 516 to microprocessor 506 at pins 31 and 34. Keyboard commands are input through switches A through I to microprocessor
30 506 at pins 73-66. DC power is supplied through power supply 520.

Commands from an external electronic apparatus are input through connector 505, a four pin connector. Pins 1 and 4 are ground. Signals from an external electronic

- 16 -

apparatus are received through pin 3 of connector 505 and transmitted through ASIC 507 through pins P20-P27 to microprocessor 506. Signals from the hand-held electronic apparatus are transmitted to the external electronic apparatus through pin 2 of connector 505.

Referring to Figure 6, a schematic of a cable 600 for connecting an action figure toy construction to a personal computer, another action figure toy construction or a docking station is shown. A four pin connector 601 connects to a hand-held electronic game apparatus through controller 603, preferably an ASIC, to serial port cable 620, which is then connected to the serial port of a personal computer. Cable 600 is powered by DC power supply 602 (two AAA batteries). Signals from cable connector pin 2 are amplified at amplifier 608 before being applied to controller 603. Signals leaving controller 603 are amplified at amplifier 609 before being output through connector pin 3. Oscillator 607 provides the signal for the internal cable clock. Similarly signals to and from serial port cable 620 are amplified at amplifiers 619 and 618 respectively.

Fighter. An example of a preprogrammed game in which the user cares for a character which can interact with other similar characters in an action figure toy construction is called Fighter. The object of this game is to train the fighters in various fighting techniques, then challenge another user to head-to-head combat. The user may train up to four fighters at a time, with the active fighter being in the foreground and the other fighters in the background. Alert functions tell the user which fighter needs attention.

Each fighter has three "wellness" statistics: health, training, and discipline. Scores range from 0 to 100. Health is an indication of how healthy the fighter

- 17 -

is. If health drops to 0, the fighter dies. Each fighter begins the game with a health of 80. Training is an indication of how well the user cares for the fighter. If the user performs all the correct activities at the correct time, the fighter's training score will increase. If the fighter misses a training activity, his training score decreases. Each fighter begins the game with a training score of 0. Discipline is an indication of the fighter's temperament. A discipline score of 0 means a lazy or bad fighter. A discipline score of 100 represents a hardworking fighter. Each fighter begins the game with a discipline score of 50.

Each fighter has three "rank" statistics: strength, agility, and willpower. The rank stats are used to determine who wins when the user's fighter meets another user's fighter in combat. Rank stats range from 0 to 100. When the game starts, each fighter has all rank stats set at 50. Strength represents the fighter's ability to win by sheer brute force (STAT A). Agility represents the fighter's ability to dodge, duck and out-move his opponent (STAT B). Willpower represents the fighter's determination and will to win (STAT C).

Each fighter also has an age, weight and total score. Age starts at 16 and has no upper limit. Weight starts at 100 and has no upper limit. Total score is the average of Health, Training, Discipline, Strength, Agility and Willpower and ranges from 0 to 100.

Master command LCD icons (activity symbols displayed on the LCD display) for the Fighter include Feed (fork/knife), Spar (boxing glove), Doctor (cross), Shower (shower), Sleep (moon), Discipline (whistle), Fight (two fists), Command Mode ("Shout"), Score (scale), Alert (alert). Similarly, Fighter includes a real-time clock, Naming feature and high score and name retention feature.

- 18 -

In addition to beeps and other notification sounds, the game will play sound effects such as eating, yelling and grunting. Sound can be turned on and off. Keyboard includes five keys: Left, Mode, Light On/Off, Enter, 5 Right.

When the game is first activated, the clock must be set. Clock mode is selected by pressing Mode then Enter. Left key sets hour, Right key sets minutes, Enter to set the time. Then the user must name the fighter, using the 10 Left/Right keys to move through the alphabet to choose a name. Once clock and name are set, the game mode begins. Game mode begins with a "welcome" animation where the fighter goes through a few of his moves.

Now the user must care for and train his fighter. 15 The object of the game is to give the fighter the right kind of training so he can defeat other fighters. The user must Feed the fighter. The fighter can be fed either Proteins (the icon looks like a steak) or Carbs (the icon looks like a loaf of bread). The user must 20 Train his fighter. Train is selected from the Menu by pressing Mode then Enter when Train is high-lighted. When reaching the Train Menu, four options are possible: Strength, Agility, Willpower, and Spar. If Train is selected and any of the four activities is selected and 25 completed (whether successfully or not), the fighter earns one point on his Training score. If the training activity is not completed for any reason, one point is deducted from the fighter's Training score.

The Strength activity is a weightlifting game. The 30 user must press the Left and Right keys alternately to successfully lift the weight. If the user presses the same key twice in a row, the fighter will falter and the weight will sink down. The fighter has a time limit to successfully lift the weight. If time runs out, the

- 19 -

fighter fails and one point is deducted from Health. The trick is to lift the weight quickly by successfully alternating the Left/Right keys. This game is played five times and each time the weight is increased. Weight starts at 200 pounds, then increases 50 pounds each stage. At the end of each successful stage, the fighter's Strength score is increased by one point. However, Strength can never exceed 80.

Agility is a dodging game. Someone off screen shoots arrows at the fighter, who must dodge out of the way by ducking, jumping, or striking the arrow aside. The arrows comes from either the right or the left and can be aimed high, low or in the middle. Pressing Left ducks the high arrows; pressing Right jumps the low arrows; pressing Enter strikes aside the middle arrows. Failure to time the movement correctly costs the fighter one Health point. Only 5 arrows are shot; each successive arrow moves faster and the time to react decreases. Each arrow avoided gives the fighter a one point increase in Agility, but this activity never takes Agility over 80.

In the Willpower activity, the fighter is shown with his arms outstretched holding two heavy buckets of water. If the fighter drops the bucket and spills any water, he fails. If the user sees the fighter's left arm getting weaker, the user must press the Left key to steady him. If his right arm gets weaker, the user must press the Right key to steady him. Each time the user's opportunity to react gets shorter, but control must be maintained for about seconds or the fighter fails and loses one point in Health. Each four seconds completed earn one point in Willpower. Willpower cannot be raised over 80 points.

- 20 -

In the Spar activity, the fighter is pitted against a computer controlled opponent. The computer's built in Stats are randomly generated from 30 to 80 points in each category. (See combat description below.)

- 5 Care of the fighter includes visits to the Doctor. Going to the Doctor will increase the fighter's Health score by one point, but the fighter can only visit the Doctor once per day. Too many visits will cause the controller to deduct one point from Discipline each time.
- 10 The fighter should clean up (Shower) at regular times. Activities such as Feed, Train and Combat will make the fighter need Showers more often. When the fighter needs to sleep, the user should turn out the light. When the fighter's Discipline gets low, this activity will bring
- 15 him back on track. The Fight icon will operate only when the fighter is linked to another fighter or the Tiger Website. Command Mode is used to toggle voice command on and off. Score Mode brings up the fighter's name, age, weight and all Stats. The Alert icon lights up when the
- 20 fighter needs something. If the fighter needs something and the user gives him the correct thing at the right time, the fighter's Health and Training are both increased by one point. The game is over when the fighter dies of bad health (Health drops to 0) or retires
- 25 due to old age (30, unless the fighter's Health is 95 or above, then he will live for an additional day).

- Combat. When two games are linked (either directly or via a PC connection to the Internet Website) together for combat play, each user has the choice of acting
- 30 first, or waiting for his opponent to act (either another user via the link, or the Tiger Website's "sparring partner"). Each fighter acts by choosing a fighting maneuver to use on his opponent. Pressing Left key chooses the Strength move, pressing Right key chooses the

- 21 -

Agility move, pressing Enter chooses the Willpower move. The fighter who goes first will be seen by both users to start his move. This gives the other user a brief movement to react with the correct counter move. The fighter who goes first gets an initial combat value equal to the Stat he chooses; he can receive from 1 to 5 points for his move (randomly generated) and 5 points for acting first. The other fighter gets an initial combat value equal to the Stat he chooses, from 1 to 5 points (randomly generated). The combat values are then adjusted according to the type of move chosen. A Strength move receives double value against a Willpower move. An Agility move receives double value against a Strength move. A Willpower move receives double value against an Agility move. This is the same as the "Rock-paper-scissors" method. In other words, Strength will usually beat Willpower, Agility will usually beat Strength, and Willpower will usually beat Agility.

When the fight is over, the computer awards a bonus based on the relative Stats of the two fighters. If a fighter loses, he always gets one point deducted from Health. Then the computer compares the Stats chosen. If a fighter's Stat is higher than his opponent's Stat and the fighter won, the fighter gets one point added to his Health. If the fighter's Stat is higher and he lost, he gets one point deducted from his Health. If the fighter's Stat is lower and he loses, he gets one point added to Training. If the fighter's Stat is lower and he wins, he gets one point added to both the Stat he chose and the Stat chosen by his opponent. For example, suppose Bob (Strength of 80, Agility of 40 and Willpower of 55) fights the Tiger computer (randomly generated Strength of 80, Agility of 40 and Willpower of 30) and Bob waits for the computer to move first. The computer

- 22 -

will go for a Strength move (its highest score). Assume Bob successfully reacts with an Agility maneuver. Bob's combat value is 40 (Agility) plus 5 (randomly generated), or 45. Hal's combat value is 80 (Strength) plus 5 for going first plus 1 (randomly generated), or 96. Since Bob chose the correct "counter move" against Hal, Bob gets his score doubled to 90 and wins the combat. Bob also gets a one point increase in both Agility and Strength.

10 If the communications link is broken during combat, the match is a draw. Since the Tiger computer matches Stat A against Stat B and Stat C in accordance with the "Rock, Paper, Scissors" algorithm, it is possible for a Fighter to engage in combat with another character, such as a Dog with Stat A (Size), Stat B (Intelligence) and Stat C (Energy). Additionally, the Tiger computer could match other characters with Stats A, B and C.

When the electronic game apparatus of the invention is linked through a cable to a serial COM port of a personal computer, separate software is installed on the personal computer or contained in the controller of the cable. The separate software enables the electronic game apparatus to communicate to a central computer, such as on the Tiger Website via the Internet. The separate software is loadable on a personal computer, and thus limited only by the memory resources of the personal computer and not the EEPROM on the electronic game apparatus. The separate software will contain the Internet protocol software. The preferred data format is 1 start bit, 8 data bits, no parity and one stop bit through an asynchronous RS-232C port with a minimum speed of 1200 bps.

The commands are typically of one byte length. Some commands may have data parameters follow. The lower six

- 23 -

bits are used for command and the upper two bits to specify Reserved, Write, Read, or Send.

The general command format for an action figure toy construction is:

5	Bit 7	Bit 6	Bit 5-0	Remarks
	0	0	Command	Reserved
	0	1	Command	Write/Set
	1	0	Command	Read
	1	1	Command	Send

10 Examples of commands include:

	Command	:	TYPE
	Code	:	XX00 0001
			READ TYPE (Link request)
15	Code	:	1000 0001 + byte + 0000 0000
			(total 11 bytes) + CKS
	Remarks	:	To get the model and revision info, CKS is checksum byte, byte is sender's ID (type)
			SEND TYPE (Link Acknowledge)
20	Code	:	1100 0001 + byte1 + byte2 + 0000 0000 (10 bytes) + CKS
	Remarks	:	Where byte1 = sender's ID byte2 = ID echo of the other apparatus

25	Command	:	NAME
	Code	:	XX00 0010
			WRITE NAME
	Code	:	0100 0010 + Name (12 characters) + CKS
30			READ NAME
	Code	:	1000 0010 + 0000 0000 (12 bytes) + CKS
	Remarks	:	Request name
			SEND NAME
35	Code	:	1100 0010 + Name (12 characters) + CKS

	Command	:	STATUS1
	Code	:	XX00 0011
			WRITE STATUS1
40	Code	:	0100 0011
			+ Pet Select (2 bytes: character/body)
			+ Age (1 byte)
			+ Weight (2 bytes)

- 24 -

```

5      + Health (1 byte)
      + STATA (1 byte)
      + STATB (1 byte)
      + STATC (1 byte)
      + Score (1 byte)
      + Training Index (1 byte)
      + Discipline Index (1 byte)
      + CKS (1 byte)
10     READ STATUS1
      Code      : 1000 0011 + 0000 0000 (12
                  bytes) + CKS
      SEND STATUS1
      Code      : 1100 0011
15      + Pet Select (2 bytes:
                  character/body)
      + Age (1 byte)
      + Weight (2 bytes)
      + Health (1 byte)
20      + STATA (1 byte)
      + STATB (1 byte)
      + STATC (1 byte)
      + Score (1 byte)
      + Training Index (1 byte)
      + Discipline Index (1 byte)
25      + CKS (1 byte)

      Command   : STATUS2
      Code      : XX00 0100
      WRITE STATUS2
30      Code      : 0100 0100
      + Pet Select (2 bytes:
                  Character/body)
      + Hungry Index (1 byte)
      + Sleep Index (1 byte)
      + Cleaning Index (1 byte)
35      + Play Index (1 byte)
      + 0000 0000 (6 bytes)
      + CKS
      READ STATUS2
40      Code      : 1000 0100 + 0000 0000 (12
                  bytes) + CKS
      SEND STATUS2
      Code      : 1100 0100
45      + Pet Select (2 bytes:
                  Character/body)
      + Hungry Index (1 byte)
      + Sleep Index (1 byte)
      + Cleaning Index (1 byte)
      + Play Index (1 byte)
      + 0000 0000 (6 bytes)
50      + CKS

```

- 25 -

Command : RAM
 Code : XX00 0101
 Remarks : This is allow read/write access
 of any parameters stored in
 GigaFet RAM.

5
 WRITE RAM
 Code : 0100 0101
 + RAM pointer (2 bytes, low
 byte first)
 10 + length (1 byte)
 + Content (9 bytes)
 + CKS

READ RAM
 Code : 1000 0101
 + RAM pointer (2 bytes, low
 byte first)
 15 + length (1 byte)
 + 0000 0000 (9 bytes)
 + CKS

SEND RAM
 Code : 1100 0101 + RAM pointer (2
 bytes, low byte first)
 20 + length (1 byte)
 + Content (9 bytes)
 25 + CKS

Command : MESSAGE
 Code : XX00 0110
 WRITE MESSAGE
 Code : 0100 0110 + Message (12
 30 characters) + CKS

Command : TERMINATION COMMAND
 Code : XX00 0111
 Remarks : Use to terminate linking
 READ TERMINATION (Termination Request)
 Code : 1000 0111 + 0000 0000 (12
 35 bytes) + CKS
 SEND TERMINATION (Termination
 Acknowledgment)
 Code : 1100 0111 + 0000 0000 (12
 40 bytes) + CKS

Command : FIGHTING MODE
 Code : XX00 1000
 Remarks : After the ack, the code will
 become non-14 bytes
 45 FIGHTING MODE request
 Code : 1000 1000 + byte + 0000 0000
 (11 bytes) + CKS
 where byte = sender's ID

- 26 -

FIGHTING MODE ack
 Code : 1100 1000 + byte1 + byte2 +
 0000 0000 (10 bytes) + CKS
 where byte1 = sender's ID
 byte2 = ID echo of other Pet
 5

Command : FIGHT
 Code : XX00 1001 or XX00 1010 or XX00
 1011
 Remarks : Variable length commands, in
 10 fighting mode only

SEND BUTTON
 Code : 1000 1001 + 0111 0110 + byte
 + CKS
 15 Where byte stands for the status of the
 button (4 buttons)
 bit 0 = Right Button
 bit 1 = Enter Button
 bit 2 = Mode Button
 bit 3 = Left Button
 20 BUTTON ACK
 Code : 1100 1001 + 0011 0110 + byte
 + CKS
 Where byte is the echo of the button
 status of the other Pet

25 IMAGE REQUEST
 Code : 0100 1010 + 1011 0101 + byte
 + CKS
 Where byte = 01 request half screen
 image
 30 byte = 02 request full screen
 image

IMAGE SENT
 Code : 1000 1010 + 0111 0101 + byte
 + CKS
 35 Where byte = 01 sent half screen image
 byte = 02 sent full screen image

IMAGE ACK
 Code : 1100 1010 + 0011 0101 + byte
 + CKS
 40 Where byte = 01 received half screen
 image
 byte = 02 received full screen
 image

WINNING
 45 Code : 1000 1011 + 0111 0100 + 0000
 0000 + CKS
 Remarks : The winning side sends out
 this command
 WINNING ACK

- 27 -

Code : 1100 1011 + 0011 0100 + 0000
0000 + CKS

FIGHTING TERMINATION REQUEST

Code : 1000 1100 + 0111 0011 + 0000
0000 + CKS

FIGHTING TERMINATION ACK

Code : 1100 1100 + 0011 0011 + 0000
0000 + CKS

5

10 While there have been illustrated and described
particular embodiments of the invention, it will be
appreciated that numerous changes and modifications will
occur to those skilled in the art, and it is intended in
the appended claims to cover all those changes and
modifications which fall within the true spirit and scope
15 of the invention.

- 28 -

What is Claimed Is:

1. An action figure toy construction having interactive, preprogrammed game play characteristics, comprising:
 - 5 a memory for storing a preprogrammed game, wherein the preprogrammed game comprises a means for generating, uniquely identifying and controlling a plurality of separate game functions involving a virtual character;
 - a torso portion configured to resemble a three-
 - 10 dimensional representation of the virtual character;
 - an input device for generating input signals in response to input commands from a user;
 - a communications unit for transmitting and receiving communication signals;
 - 15 a controller for receiving, processing and outputting data, graphics and text images, and control signals during operation of the preprogrammed game; and
 - a display mounted within the torso portion for displaying graphics and text images generated during play
 - 20 of the preprogrammed game.
2. The action figure toy construction of claim 1 wherein the torso portion includes appendages which the user can move in conjunction with play of the preprogrammed game.
- 25 3. The action figure toy construction of claim 1 wherein the communications unit is configured to be coupled to another electronic apparatus.
4. The action figure toy construction of claim 1 wherein said electronic apparatus comprises a remote

- 29 -

central processing unit having means for modifying the preprogrammed game.

5 5. The action figure toy construction of claim 3 further comprising means for linking the action figure toy construction to the remote central processing unit.

6. The action figure toy construction of claim 5 wherein said linking means comprises a personal computer.

10 7. The action figure toy construction of claim 6 of claim 6 wherein said remote central processing unit comprises means for simulating an action figure toy construction for enabling interactive play of the preprogrammed game between the action figure toy construction and the central processing unit.

15 8. The action figure toy construction of claim 5 wherein said linking means comprises means for communicating on the Internet.

9. The action figure toy construction of claim 3 wherein the electronic apparatus comprises a second action figure toy construction.

20 10. The action figure toy construction of claim 1 wherein the virtual character is configured to resemble a humanoid character.

25 11. The action figure toy construction of claim 1 wherein the virtual character is configured to resemble a vehicle.

- 30 -

12. The action figure toy construction of claim 1 wherein the communications unit comprises an infrared emitter and detector.

13. The action figure toy construction of claim 3
5 wherein the electronic apparatus comprises a docking station for linking a plurality of action figure toy constructions together for multi-player game play of the preprogrammed game.

14. The action figure toy construction of claim 1
10 wherein communications unit comprises an RS-232 communications port.

15. An action figure toy construction having interactive, preprogrammed game play characteristics, comprising:

15 a memory for storing a preprogrammed game, wherein the preprogrammed game comprises a means for generating, uniquely identifying and controlling a plurality of separate game functions involving a virtual character, and for storing temporary data generated during play of
20 the preprogrammed game;

a torso portion configured to resemble a three-dimensional representation of the virtual character;

an input device for generating input signals in response to input commands from a user;

25 a communications unit for transmitting and receiving communication signals;

a controller for receiving, processing and outputting data, graphics and text images, and control signals during operation of the preprogrammed game;

- 31 -

a display mounted within the torso portion for displaying graphics and text images generated during play of the preprogrammed game; and

5 an audio circuit for generating audio signals during play of the preprogrammed game and for receiving audio signals from said user during play of said preprogrammed game.

10 16. The action figure toy construction of claim 15 wherein the audio circuit includes a microphone and a speaker.

17. The action figure toy construction of claim 15 further comprising a light.

18. The action figure toy construction of claim 15 further comprising a motion detector.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US99/18201

A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) : A63H 3/28

US CL : 446/297

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 446/101, 175, 295, 297, 302, 303, 321, 472, 487;
273/310, 311

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X — Y	US 4,802,879 A (RISSMAN et al.) 07 February 1989, See entire document	1, 2, 3, 4, 5, 7, 9, 10, 13, 15, 16, 17 and 18 ----- 11, 12, 14
Y	US 5,746,602 A (KIKINIS) 05 May 1998, See entire document	8
Y	US, 5,636,994 A (TONG) 10 June 1997, See entire document	6

☐ Further documents are listed in the continuation of Box C.☐ See patent family annex.

* Special categories of cited documents:	*T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
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O documents referring to an oral disclosure, use, exhibition or other means	
P document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search

07 DECEMBER 1999

Date of mailing of the international search report

13 JAN 2000

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EE	Estonia	LR	Liberia	SG	Singapore		

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 98/13482

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1/6

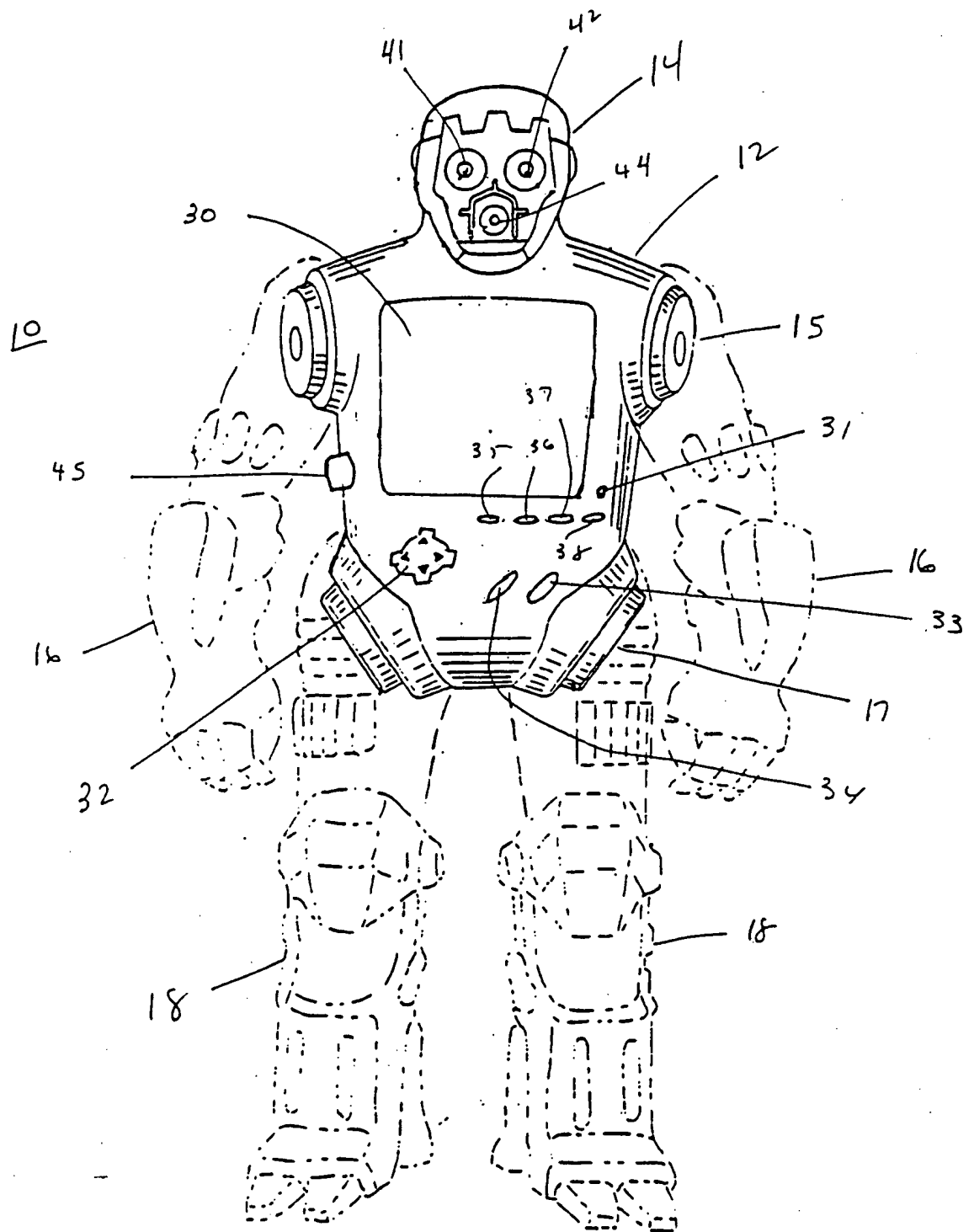


Fig. 1

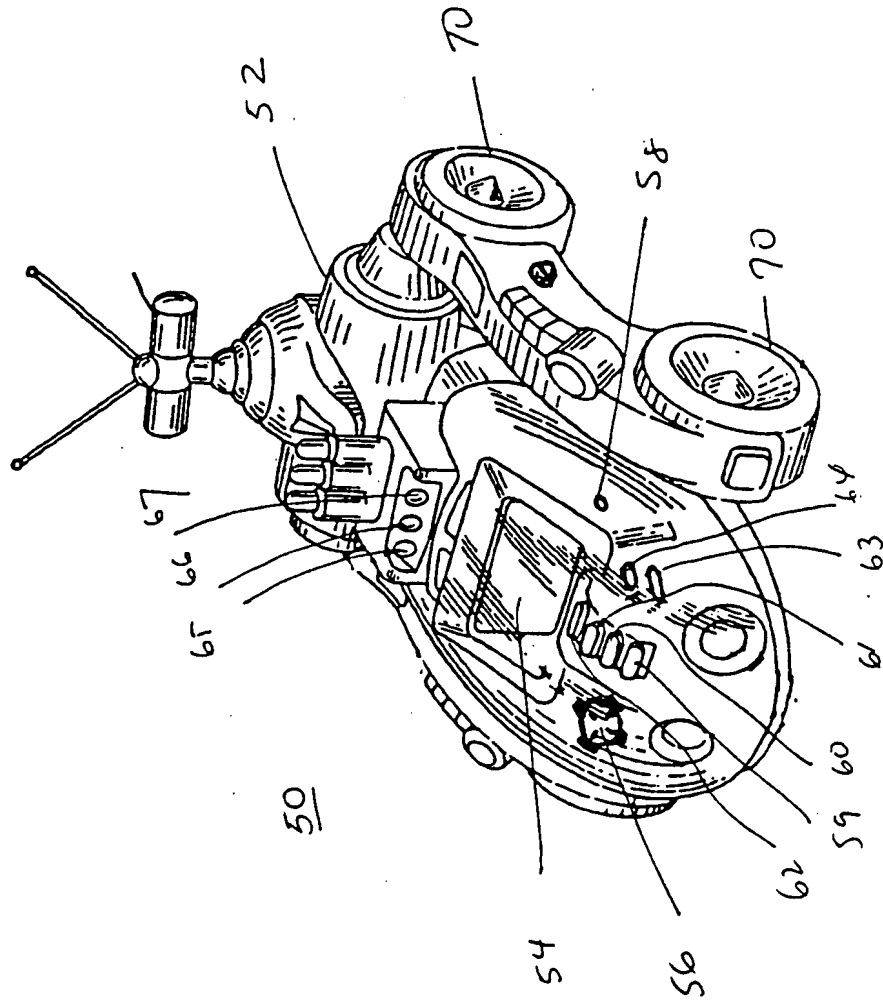


Fig. 2

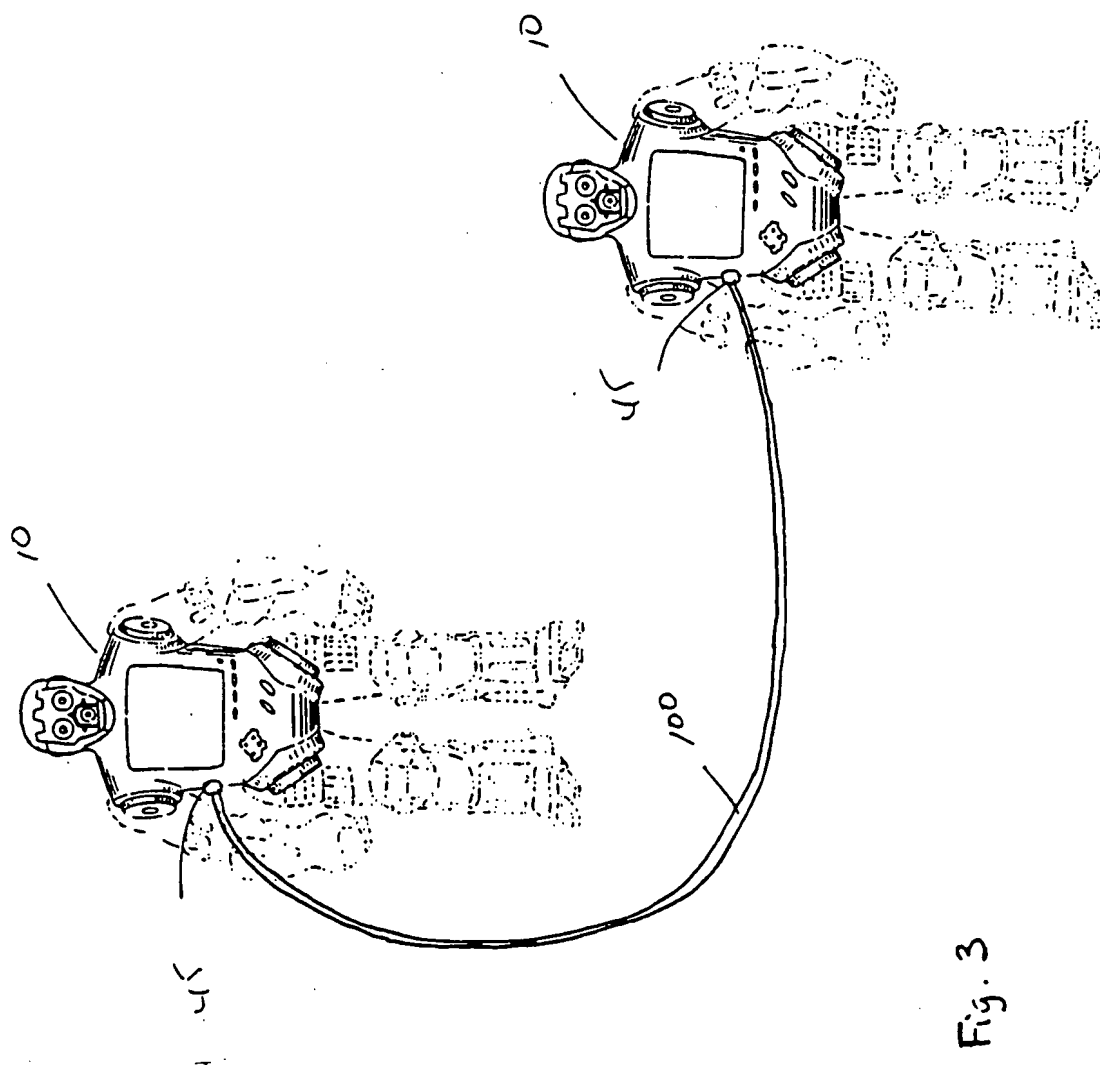


Fig. 3

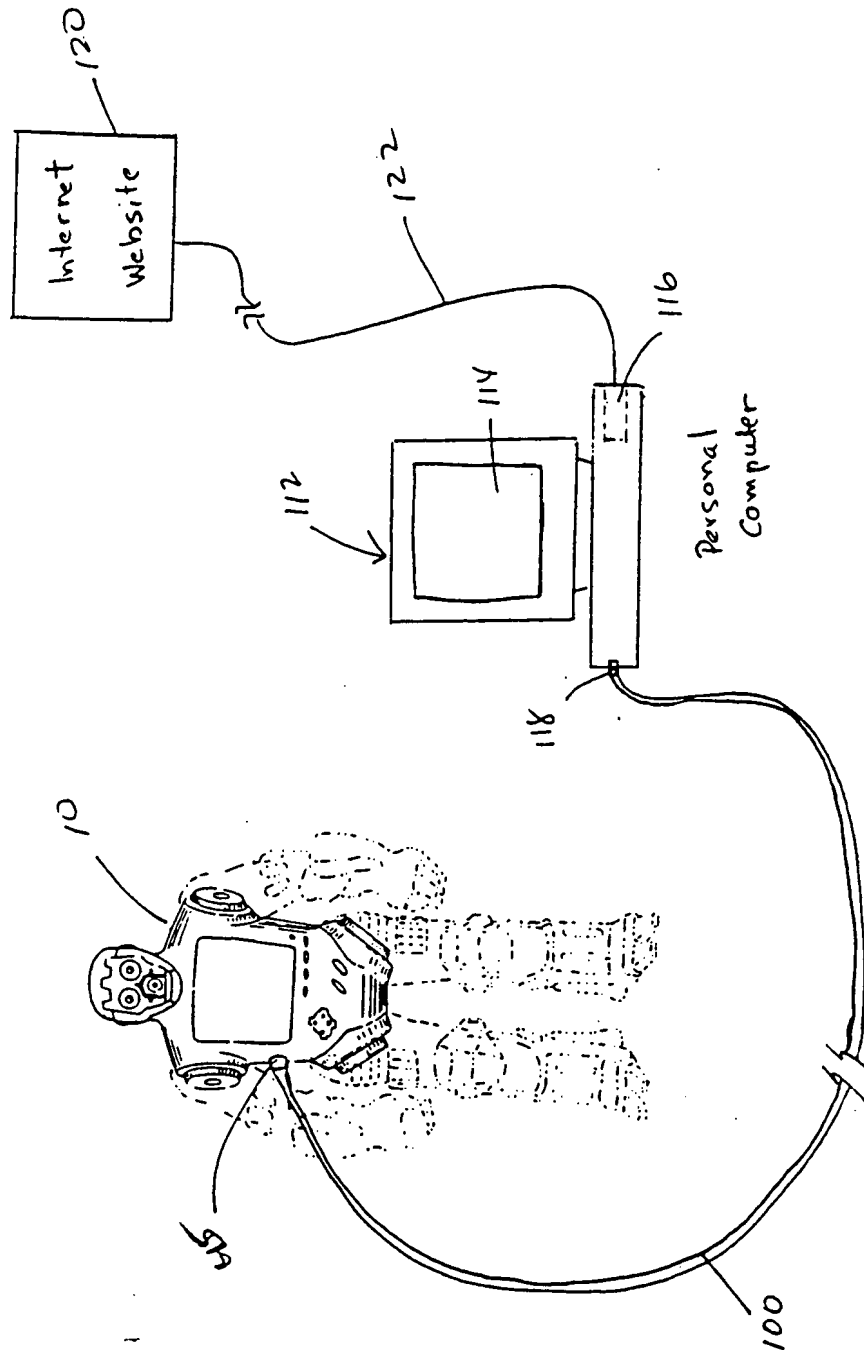


Fig. 4

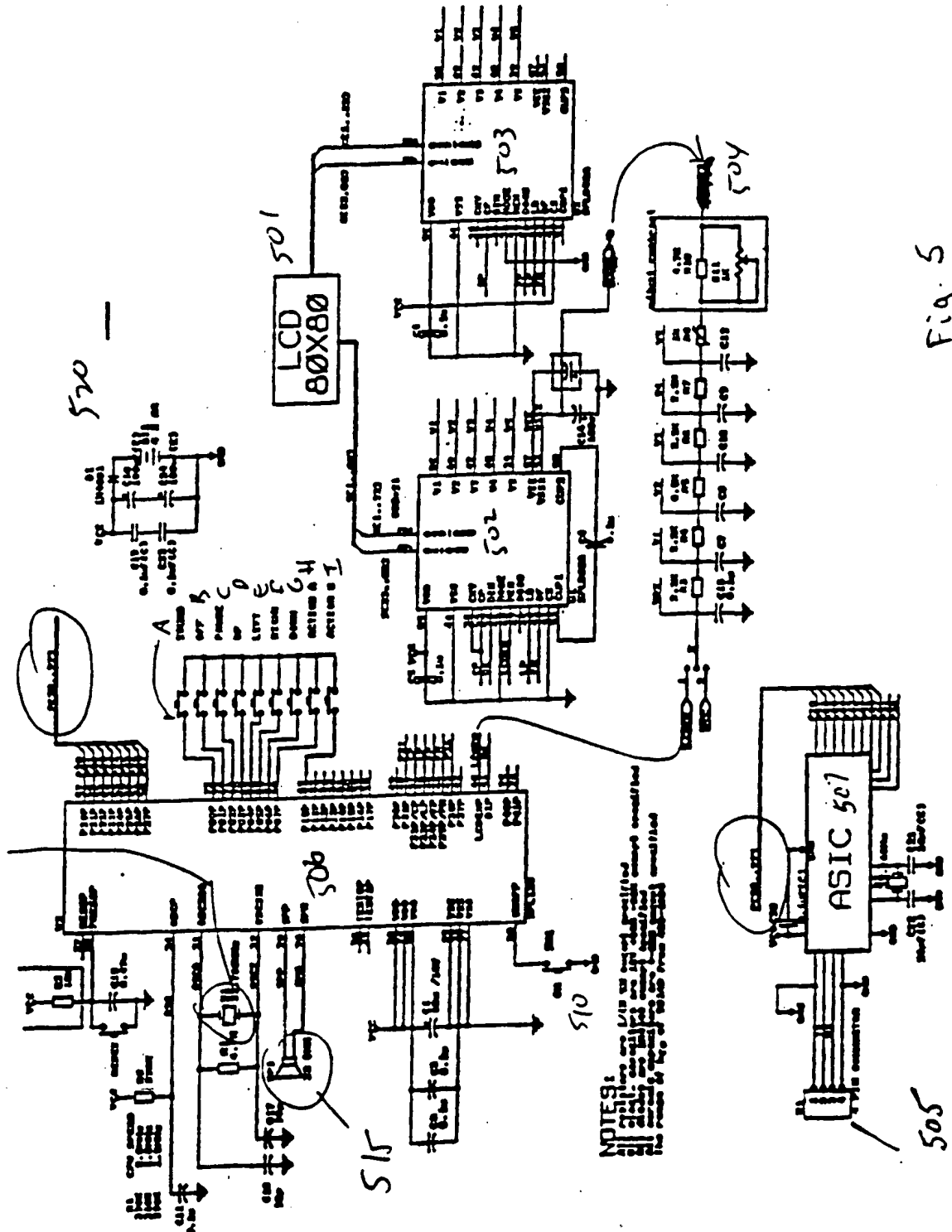


Fig. 5

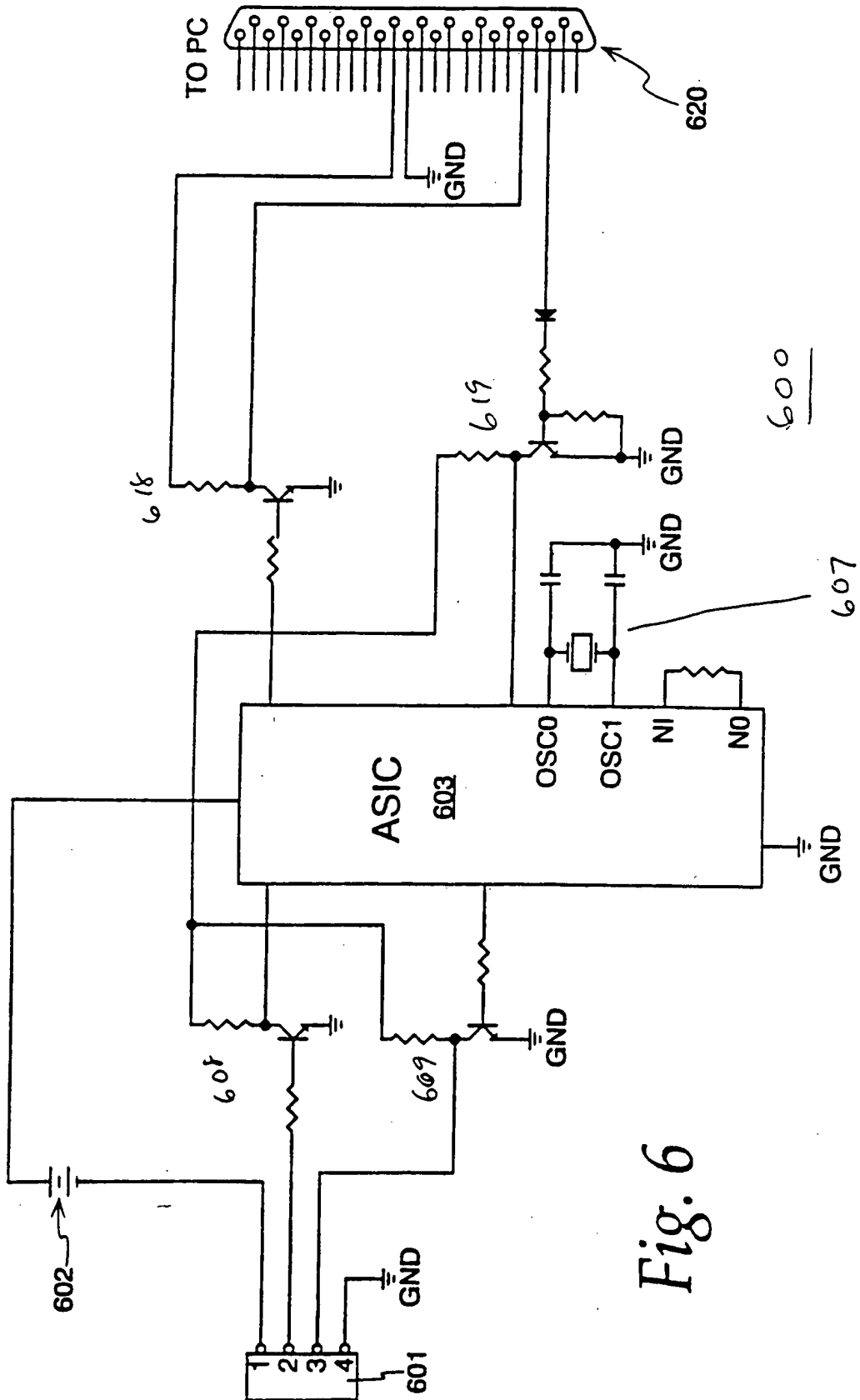


Fig. 6